EMERGENCY RESPONSE REPORT

FOR

FLOWCHEM TECHNOLOGIES
289 CUTLASS LOOP
RAYNE, ACADIA PARISH, LOUISIANA

Prepared for

U.S. Environmental Protection Agency
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1. INTRODUCTION

On 03 May 2018 at 1940 hours, the U.S. Environmental Protection Agency (EPA) Region 6 Phone Duty Officer was notified by a Federal Emergency Management Agency (FEMA) Region 6 Watch Spot Report concerning an incident that occurred earlier that day involving explosions and a fire at a chemical facility located near the town of Rayne in Acadia Parish, Louisiana; no notification was made to the National Response Center. Through subsequent briefings with the Louisiana Department of Environmental Quality (LDEQ), the Region 6 EPA-Emergency Management Branch (EMB) discovered the incident occurred at approximately 1600 hours on 03 May 2018 at the FlowChem Technologies (FlowChem) chemical blending facility (facility) that blends, stores, and distributes specialty oilfield chemicals. Furthermore, LDEQ reported that state and local responders were on-scene, and road closures, shelter-in-place, and evacuations were issued by the Louisiana State Police (LSP). The fire was controlled by 2000 hours and fire suppression run-off was contained within a drainage system through use of earthen berms; FlowChem contractors were in route to commence response activities. A Site Location Map is provided as Attachment A.

On 03 May 2018, EPA-EMB activated Weston Solutions, Inc. (WESTON®), the EPA Region 6 Superfund Technical Assessment and Response Team (START) contractor, to respond to the incident the with Tier 2 capabilities. START was tasked to mobilize to the incident on 04 May 2018 and conduct relevant response activities in support of EPA's response to the incident under the direction of EPA On-scene Coordinator (OSC) Randy Guidry and as outlined in Technical Direction Document (TDD) No. 0001/18-123 (Attachment I). From 03 to 31 May 2018, EPA conducted an incident assessment, response coordination, and provided followup site visits as part of the FlowChem Technologies Emergency Response action and as described within this Report.

2. BACKGROUND

The FlowChem facility is located within a small industrial business park area at 289 Cutlass Loop, Rayne, Acadia Parish, Louisiana. The geographic coordinates of the incident location are Latitude 30.2482779° North and Longitude 92.1985769° West as determined through computer-based mapping software (2018 Google Earth Pro). The facility is bordered by Interstate 10 and undeveloped land with a small RV park and hotel to the south; a small business, undeveloped land, and rural residential areas to the west; main business office (northeast), other businesses, and undeveloped land

and rural residential areas to the north; and additional FlowChem property utilized for distribution, other businesses, public roads, and undeveloped land to the east. A site area map is provided as Attachment B.

The facility encompasses approximately 2 acres that consists of a cement slab with a storage building and an outdoor storage area on the eastern half and a multi-use building, outdoor storage area, and 10 aboveground storage tanks (ASTs) on the western half. The outdoor storage areas contained numerous storage containers (i.e., drums, totes, and tanks). The multi-use building consisted of business offices, laboratory, chemical storage, and a blending area. The facility drainage sheet flows north over the cement slab and into a series of belowground drainage storm drains, as well as across the Cutlass Loop into surface open drainage ditches that flow northeast into a drainage canal that flows south approximately 1.3 miles into Bayou Queue de Tortue. A Site Sketch and Surface Water Pathway Map are provided as Attachments C and D, respectively.

At the time of the incident, FlowChem had various oilfield products and intermediate chemicals stored at their facility. The oilfield products included, but not limited to, descaling agents, hydrogen sulfide scavengers, water clarifiers, gas hydrate inhibitors, polymers, corrosion inhibitors, surfactants, detergents, degreasers, demulsifies, chemical intermediates, and organic solvents. The chemical components of the products that were disturbed by the incident included, but were not limited to, sulphamic, acetic, formic, sulfuric, hydrochloric, alkyl benzenesulfonic, phosphoric, citric, polyacrylic, glycolic, phosphinated polycarboxylic, and polyphosphoric acids; sodium hydroxide; hydrogen peroxide; methanol; isopropanol; ethanols; 2-ethylhexanol; phenol; acetone; hexanes; xylenes; ethylenebenzene; naphthalene; toluene; cumene; various naphtha including light and heavy aromatic solvent; diesel fuel; soybean oil; carbon disulfide; monobutyl ether; formaldehyde; quaternary amines; ammonium chloride; ammonium bisulfide; carbamates; calcium nitrate; acrylamide; zinc dioctanoate; dimethyl siloxane; sodium xylene and ammonium alkylaryl sulfonates; mannich and acrylic polymers; sodium nitrile-triacetate; ethylene glycol; glycol ethers; and glycerin. A chemical inventory of the oilfield chemical products and their chemical components involved in the incident is provided as Attachment E.

The incident posed a threat to human health and the environment due to generation of noxious emissions and the release of fire suppression water that contained potentially hazardous substances,

contaminates, and/or pollutants. As a result of the fire, numerous storage containers at the facility were damaged allowing their chemical contents to burn and/or spill. The fire generated noxious emissions as the spilled chemicals burned. At the time of the incident, the area experienced winds from the south, which blew chemical fire emissions to the area north of the facility and toward a residential area. In addition, the fire suppression water utilized to control the fire mixed with spilled chemicals facilitating their release into the storm water drainage system and migration downgradient into the adjacent drainage canal.

3. SUMMARY OF ACTIONS

From 03 to 31 May 2018, EPA conducted the following actions as part of its response to the FlowChem Technologies fire: incident assessment; response coordination; and followup site visits. Written and photographic documentation gathered during the response is provided as Attachments F and G, respectively. During the response, EPA summarized site status and response actions within Pollution Reports (POLREPs) provided as Attachment H.

On 04 May 2018, the EPA Team, consisting of EPA OSC Guidry and START contractor, mobilized to the incident and commenced relevant response activities by conducting an incident assessment and response coordination with LDEQ, Acadia Parish Sheriff Department (APSD), and FlowChem representatives and their contractors. Through these actions, the EPA Team obtained the following information:

- On 03 May 2018 at approximately 1600 hours, explosions and a fire occurred at the FlowChem facility. At the time of this report, the exact cause of the incident is unknown; however, it involved ignition of a flammable liquid during transfer operations.
- At 1601 hours, LSP, LDEQ, APSD, local fire departments, and other local and state agencies were notified of the incident under LSP Incident # 18-02071 and then responded to the incident by approximately 1630 hours. For public safety, LSP closed both the east and west bound lanes of Interstate 10 and established a 1-mile evacuation zone and a 3-mile shelter-in-place for nearby residences and businesses.
- At approximately 1800 hours, LDEQ commenced community ambient air monitoring within shelter-in-place and evacuated areas that revealed non-detectable concentrations of volatile organic compounds.

- By 2000 hours, the local fire departments was able to control the fire through use of water and fire suppression foam. The fire suppression water mixed with the spilled chemicals and released into the drainage system and the adjacent drainage canal where it was contained utilizing multiple earthen berms. The impacted drainage systems consisted of approximately 1,920 feet of surface drainage ditches, 2,630 feet of belowground drainage, and 510 feet of drainage canal. In addition to the impacted drainage system and canal, chemical run-off impacted a portion of Cutlass Loop located just north of the facility. Contaminated fire suppression water impacted two areas of surface soil; one area was located west of facility and the second area was located south of Cutlass Loop near the nexus of drainage ditches. The facility area (incident area) also contained numerous damaged storage containers, spilled chemicals, and a structurally unsound multi-use building. Impacted areas are illustrated on Attachment C Site Sketch.
- By 2200 hours, FlowChem environmental and cleanup contractors responded to the incident and began response activities. The response activities included recovery of contaminated fire suppression water from drainage system and canal, as well as ambient air monitoring that also revealed non-detectable concentrations of volatile organic compounds.
- Interstate 10 was reopened at 0200 hours on 04 May 2018 by LSP after air monitoring conducted by LDEQ indicated noxious emissions were no longer a threat to human health and the environment. Evacuated residents (approximately 71) were allowed to reenter their residences at 0600 hours and following air monitoring by LDEQ.

Through 05 May 2018, EPA team provided oversight of FlowChem's response actions along with LDEQ. During this time, FlowChem conducted the following activities:

- Decontaminated firefighting equipment utilized during the incident;
- Began cleanup of incident area through removal of undamaged storage containers and spilled chemicals, and installed an earthen berm along downgradient (north side) of area as containment measure;
- Completed cleanup of impacted area of Cutlass Loop through use of pressure washer to flush chemical residue into open surface drainage ditches where it was recovered;
- Continued recovery of contaminated fire suppression water from drainage system and canal through use of vacuum trucks to recover material, fresh water flushes to clean drainage system

and push residual contamination toward recovery locations, and installation of additional earthen berms to prevent recontamination of recovered areas. Cleanup of the impacted drainage system and canal was conducted moving from the most downstream location toward upstream in order to reduce the threat of further downstream migration;

- Completed initial cleanup of the 510 feet (approximate) of impacted drainage canal and 265 feet (approximate) of most downgradient open surface drainage ditch through removal of contaminated fire suppression water and excavation/scrape of surface to remove visual contamination. As a containment measure, the up and downstream earthen berms were left in-place within drainage canal and maintained to prevent further downstream migration. The berms remained in-place until confirmation soil samples, per LDEQ's requirements, were collected and analyzed by FlowChem's environmental contractor, and the analytes were determined to be within acceptable levels as compared to LDEQ's Risk Evaluation/Corrective Action Program (RECAP). LDEQ provided oversight/direction for confirmation cleanup sampling activities;
- Completed initial cleanup of approximately 14,000 square feet of impacted surface soil in the area located south of Cutlass Loop near nexus of drainage ditches as well as the impacted soil area located west of the drainage canal. Cleanup activities were completed by excavation/scrape of the areas with denuded vegetation and staining that also required confirmation soil sampling per LDEQ's requirements;
- Continued to conduct ambient air monitoring along perimeter of incident area and around impacted drainage that revealed non-detectable concentrations of VOCs and confirmed by ambient air monitoring conducted by LDEQ and EPA; and
- Waste generated during cleanup operations was held in on-site fraction tanks and roll-off boxes, as applicable. A waste characterization sample of the recovered contaminated fire suppression water was collected by FlowChem's environmental contractor and submitted for analysis.

FlowChem and its contractors planned to continue response actions until they had mitigated the threat posed by the incident. Also, LDEQ planned to provide continued oversight during cleanup activities.

On 05 May 2018, EPA OSC Guidry determined the incident was stable due to the lack of noxious emissions; recovery of contaminated fire suppression water from drainage system and canal; initial

cleanup of most downstream portion of drainage system and canal; planned maintenance of earthen berms within drainage canal; containment and partial recovery of chemical spillage within incident location; and on-going response actions. Following on-site activities on 05 May 2018, the EPA team demobilized from the site due to the stable state of the incident and the planned oversight by LDEQ. In addition, EPA planned to maintain response coordination with LDEQ and FlowChem's response contractors, as well as to conduct followup site visits as progress was made.

On 11, 25, and 31 May 2018, EPA conducted followup site visits to assess the status of the incident response. The followup site visits consisted of impacted area assessments and briefings with LDEQ and FlowChem's response contractors, as applicable, to determine and document the impacted area cleanup progress, review ambient air monitoring results, determine waste disposition, and document planned actions. During this time, FlowChem conducted the following activities:

- Addressed a total of approximately 6,980 feet of drainage system (1,920 feet of open surface drainage ditches and 2,630 feet of belowground drainage) and approximately 510 feet of drainage canal through a combination of contaminated fire suppression water recovery, fresh water flushes, and excavation/scrape of impacted soil within drainage, as applicable. Earthen berms within the drainage canal were removed and natural flow restored. Also, addressed the two areas of impacted surface soil through the excavation/scraping of a total of approximately 1,900 square feet of soil. Following excavation/scraping of impacted areas, confirmation soil samples were collected per LDEQ's requirements, and re-excavated/re-scraped and then resampled, as needed to meet LDEQ's RECAP requirements;

- Completed cleanup of incident location as of 25 May 2018 through the removal of undamaged and damaged storage containers including the transfer of contents, as needed; decontamination of cement slab following removal of spilled chemicals and residue; and removal of damaged multi-use building. Following cleanup of incident location, eight soil samples were collected through the cement slab to a depth of 5 feet belowground surface that indicated the incident did not impact the soil below the cement slab;

- Continued ambient air monitoring through 24 May 2018 that indicated the incident and associated cleanup operations were not impacting ambient air quality; and

- Commenced off-site disposal of generated waste.

FlowChem generated a total of 11 waste streams during the incident response. These waste streams included the following with their approximate volumes and associated disposal facilities noted:

- 4,000 cubic yards of contaminated soil – Waste Management located in Livonia, Louisiana;
- 150 cubic yards of chemical residue sludge – Clear Harbors located in White Castle, Louisiana;
- 100 cubic yards of solidified corrosive – Chemical Waste Management located in Sulphur, Louisiana;
- 14,000 gallons of co-mingled flammable liquids - Chemical Waste Management located in Sulphur, Louisiana;
- 125 cubic yards of P Listed Hazardous (lab debris) - Chemical Waste Management located in Sulphur, Louisiana;
- 1,750 cubic yards of non-hazardous solid waste (metal containers, construction debris, PPE, and trash) – to be determined;
- 5 55-gallon drums (275 gallon) of spent carbon – sampled for waste disposal;
- One 55-gallon drum of aerosol cans - Chemical Waste Management located in Sulphur, Louisiana;
- 1,500 gallons of acidic liquids - Chemical Waste Management located in Sulphur, Louisiana;
- 4,500 gallons of basic liquids - Chemical Waste Management located in Sulphur, Louisiana; and
- 600,000 gallons of recovered liquids (contaminated impacted fire suppression water and fresh water used during flushing of drainage) – Preston Environmental located in Baton Rouge, Louisiana.

On 31 May 2018, the EPA conducted its final followup site visit, at which time, it was determined that FlowChem and its contractors had nearly completed cleanup activities, and further oversight by EPA was not needed. The remaining cleanup actions included additional excavation/scraping of a small portion of drainage system that included open surface drainage ditches and belowground drainage located along western end of Cutlass Loop due to exceedances of formaldehyde as compared to RECAP criteria, as illustrated on the Site Sketch (Attachment C); waste disposal; and site

restoration.

This Final Report was prepared as part of the requirements of TDD No. 0001/18-123 and serves as documentation of work completed.

4. LIST OF ATTACHMENTS

A. Site Location Map

B. Site Area Map

C. Site Sketch

D. Surface Water Pathway Map

E. Chemical Inventory

F. Site Logbook

G. Digital Photographs

H. Pollution Reports

I. TDD No. 0001/18-123

☐ The EPA Task Monitor did not provide final approval of this report prior to the completion date of the work assignment. Therefore, Weston Solutions, Inc. has submitted this report absent the Task Monitor's approval.

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